

SOME QUANTITATIVE DETERMINATIONS OF GLOCHIDIA

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In the course of some experimental studies it became desirable to know the number of glochidia in certain mass units, and to ascertain whether or not the number of glochidia per volume unit was fairly constant for a given species. A review of the literature however, revealed only references to the number of glochidia produced in a season by a female mussel, and some size measurements on individual glochidia of certain species. Accordingly actual counts, weights and measurements of seven species of glochidia have been made. These studies were made at the United States Bureau of Fisheries Biological Station at Fairport, Iowa, and at the University of Missouri.

The marsupia were removed from live, gravid, female mussels and the glochidia freed by cutting each marsupium along the ventral margin, the glochidia being forced out by gentle pressure. The glochidia were then carefully washed in tap water and freed from the remains of the conglutinates by taking up large numbers of glochidia into a pipette and forcing them out again. The cleaned glochidia were next transferred to a weak solution of sodium chloride (0.1%) in which they promptly closed. The closed glochidia were separated, placed in a graduated centrifuge tube, and centrifuged gently until the glochidia were quite closely packed. The salt solution was decanted off and the drops remaining in the tube and on the glochidial mass taken up with filter paper, after which the weighings were made. The glochidia were then preserved for counting in a formalin-alcohol mixture. Linear measurements were made from unpreserved glochidia. In some cases an entire cubic centimeter was counted, but in others only part of the cubic centimeter was counted, and the total computed. A number of glochidia were taken up in a considerable quantity of water and spread over the bottom of a petri

dish, where the counts were made under low power magnifying glass.

All of the species used were of the "long-period" or "winter-breeder" type. In this group the eggs are fertilized during the latter part of summer, usually in August, and the glochidia, which are carried in a fully developed condition in the marsupium throughout the winter, are not discharged until the following summer. It seems probable that there is no increase in size of the glochidia after they become mature from early autumn to winter, and it has been shown (Corwin, 1920) that fish may be infected successfully with glochidia taken from long term breeders in fall, and that these glochidia will undergo development. The counts reported here for *Lampsilis ligamentina*, *L. luteola* and the *L. anodontoides* var. were made in the months from February to May inclusive, while those for *Lampsilis anodontoides*, *L. fallaciosa*, *Symphynota compressa*, and *Strophitus edentulus*, were made during June and July.

Although differences in size of glochidia within the species are noted by Ortmann (1912) and by Howard (1914), the size values obtained in the present studies are in the same range as those given by other workers for closely related species, and the volume values offer additional proof of the enormous number of glochidia produced by a single female in one season.

Corwin, R. S. (1920); Trans. Amer. Fisheries Soc., XLIV, pp. 81-84.

Howard, A. D. (1914); Appendix IV, Report, U. S. Commissioner of Fisheries, 1913.

Ortmann, E. A. (1912); Annals, Car. Mus. VIII, pp. 222-365.

Surber, T. (1912); U. S. Bureau of Fisheries Doc. 771, 10 pp. Physiological Laboratory, University of Missouri.

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Species	Locality	Drainage	Number of glochidia in one cc.	Size in mm.	Weight of one cc.
<i>Lampsilis ligamentina</i>	Lake City, Minn.	Mississippi	101,700	.232 x .265 mm.	.....
<i>Lampsilis luteola</i>	Lake Pepin, Minn.	Mississippi	94,300	.232 x .263 mm.	.....
<i>Lampsilis luteola</i>	Lake Pepin, Minn.	Mississippi	96,900	.232 x .263 mm.	1.0732 gms.
<i>Lampsilis anodontoides</i>	Fairport, Iowa	Mississippi	269,000	.200 x .180 mm.	1.1774 gms.
<i>Lampsilis anodontoides</i>	Fairport, Iowa	Mississippi	243,000	.200 x .180 mm.	1.2525 gms.
<i>Lampsilis anodontoides</i>	Fairport, Iowa	Mississippi	245,000	.200 x .180 mm.	1.2190 gms.
<i>Lampsilis fallaciosa</i>	Fairport, Iowa	Mississippi	185,000	.240 x .180 mm.	1.5604 gms.
<i>Lampsilis fallaciosa</i>	Fairport, Iowa	Mississippi	233,000	.240 x .180 mm.	1.1356 gms.
<i>Lampsilis anodontoides</i> var.	Mercedes, Texas	Rio Grande	77,000	.....	1.0732 gms.
<i>Lampsilis anodontoides</i> var.	Mercedes, Texas	Rio Grande	77,000	.....	1.0988 gms.
<i>Lampsilis anodontoides</i> var.	Mercedes, Texas	Rio Grande	79,000	.....	1.1758 gms.
<i>Lampsilis anodontoides</i> var.	Mercedes, Texas	Rio Grande	100,000	.....	1.1181 gms.
<i>Symphynota compressa</i>	Fairport, Iowa	Mississippi	2,094,400	.090 x .080 mm.	1.1955 gms.
<i>Strophitus edentulus</i>	Fairport, Iowa	Mississippi	537,000	.350 x .285 mm.*	1.0122 gms.

fide Surber, 1912